

WHAT IS CLAIMED IS:

1. A battery state monitoring circuit, comprising:

a switch circuit that adjusts a current of a secondary battery which is chargeable and dischargeable; and

a detecting circuit that monitors at least one of a voltage and the current of the secondary battery and outputs a signal for controlling the switch circuit, wherein:

the detecting circuit outputs the signal for controlling the switch circuit in accordance with a state of the secondary battery with respect to one of a specified voltage value and a specified current value;

the signal is one of: a detection signal for starting one of charge protection and discharge protection of the secondary battery; and a release signal for releasing the one of the charge protection and the discharge protection of the secondary battery; and

a switching rate from the release signal to the detection signal is higher than a switching rate from the detection signal to the release signal.

2. A battery state monitoring circuit according to claim 1, wherein:

the detecting circuit is an over-charge detecting circuit that can detect an upper limit voltage to which the secondary battery is charged; and

the over-charge detecting circuit outputs:

the detection signal for the charge protection of the secondary battery by the switch circuit when the voltage of the secondary battery is larger than the upper limit voltage to which the secondary battery is charged; and

the release signal for releasing the charge protection of the secondary battery by the switch circuit when the voltage of the secondary battery is equal to or smaller than the upper limit voltage to which the secondary battery is charged.

3. A battery state monitoring circuit according to claim 1, wherein:

the detecting circuit is an over-discharge detecting circuit that can detect a lower limit voltage to which the secondary battery is discharged; and

the over-discharge detecting circuit outputs:

the detection signal for the discharge protection of the secondary battery by the switch circuit when the voltage of the secondary battery is equal to or smaller than the lower limit voltage to which the secondary battery is discharged; and

the release signal for releasing the discharge protection of the secondary battery by the switch circuit when the voltage of the secondary battery is larger than the lower limit voltage to which the secondary battery is discharged.

4. A battery state monitoring circuit according to claim 1, wherein:

the detecting circuit is an over-current detecting circuit that can detect an upper limit current to which the secondary battery is discharged; and

the over-discharge detecting circuit outputs:

the detection signal for the discharge protection of the secondary battery by the switch circuit when the current of the secondary battery is larger than the upper limit current to which the secondary battery is current to which the secondary battery is discharged; and

the release signal for releasing the discharge protection of the secondary battery by the switch circuit when the current of the secondary battery is equal to or smaller than the upper limit current to which the secondary battery is charged.

5. A battery device, comprising:
a switch circuit that adjusts a current of a secondary battery which is chargeable and dischargeable; and

a detecting circuit that monitors at least one of a voltage and the current of the secondary battery and outputs a signal for controlling the switch circuit, wherein:

the detecting circuit outputs the signal for controlling the

switch circuit in accordance with a state of the secondary battery with respect to one of a specified voltage value and a specified current value;

the signal is one of: a detection signal for starting one of charge protection and discharge protection of the secondary battery; and a release signal for releasing the one of the charge protection and the discharge protection of the secondary battery; and

a switching rate from the release signal to the detection signal is higher than a switching rate from the detection signal to the release signal.

6. A battery device according to claim 5, wherein:

the detecting circuit is an over-charge detecting circuit that can detect an upper limit voltage to which the secondary battery is charged; and

the over-charge detecting circuit outputs:

the detection signal for the charge protection of the secondary battery by the switch circuit when the voltage of the secondary battery is larger than the upper limit voltage to which the secondary battery is charged; and

the release signal for releasing the charge protection of the secondary battery by the switch circuit when the voltage of the secondary battery is equal to or smaller than the upper limit voltage to which the secondary battery is charged.

7. A battery device according to claim 5, wherein:

the detecting circuit is an over-discharge detecting circuit that can detect a lower limit voltage to which the secondary battery is discharged; and

the over-discharge detecting circuit outputs:

the detection signal for the discharge protection of the secondary battery by the switch circuit when the voltage of the secondary battery is equal to or smaller than the lower limit voltage to which the secondary battery is discharged; and

the release signal for releasing the discharge protection of the secondary battery by the switch circuit when the voltage of the secondary battery is larger than the lower limit voltage to which the secondary battery is discharged.

8. A battery device according to claim 5, wherein:

the detecting circuit is an over-current detecting circuit that can detect an upper limit current to which the secondary battery is discharged; and

the over-discharge detecting circuit outputs:

the detection signal for the discharge protection of the secondary battery by the switch circuit when the current of the secondary battery is larger than the upper limit current to which the secondary battery is current to which the secondary battery

is discharged; and

the release signal for releasing the discharge protection of the secondary battery by the switch circuit when the current of the secondary battery is equal to or smaller than the upper limit current to which the secondary battery is charged.